

REMARKS

The Claims were 1-3. Claim 1 has been amended, Claim 2 has been canceled and Claims 4 and 5 have been added. Thus, Claims 1, 3, 4 and 5 are pending in this case all to more clearly and distinctly claim Applicant's invention. New Claims 4 and 5 introduce no new matter and are fully supported by the specification. Applicant respectfully request entry of the amendments as they place the application in condition for allowance or in better condition for possible appeal.

Claim 1 has been amended to add that the liquid blocking layer is composed of at least two types of porous membrane layers which are impermeable to aqueous liquids, wherein pore diameter in the uppermost porous membrane of said at least two types of porous membrane layers, which contacts said reagent layer, is equal to or smaller than that of a just underlying porous membrane. Support for this amendment appears, for example, in the specification at page 7, lines 4-26. Further, the limitations of Claim 2 has been incorporated into Claim 1. New claim 4 depends appropriately from Claim 1 and introduce no new matter. Support for the total thickness of the liquid blocking layer as claimed in Claim 4 may be found on page 7, lines 21-26 of the specification. New claim 5 depends appropriately from Claim 1 and introduce no new matter. Support for the pore diameter in the uppermost membrane and that of a just underlying porous membrane as claimed in Claim 5 may be found on page 7, lines 8-15 of the specification. Accordingly, it is respectfully submitted that no new matter has been added by the amendments.

The Examiner rejects Claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,008,078 to Yaginuma et al. in view of U.S. Patent No. 6,395,325 to Hedge et al. Applicant respectfully traverse this rejection.

The Examiner asserts that Yaginuma teaches an integral multi-layer analysis element for the determination of ammonia or ammonia-producing substance comprising a transparent

support, an indicator layer containing an indicator which produces a detectable change by gaseous ammonia, a liquid blocking layer permitting a gaseous ammonia to pass therethrough, a reagent layer containing an alkaline buffering agent and optionally a reagent capable of reacting with said ammonia-producing substance to produce ammonia, and a spreading layer, adhesively laminated in this order.

The Examiner acknowledges that Yaginuma does not teach that the liquid blocking layer is composed of at least two porous membrane layers.

The Examiner then asserts that Yaginuma states that there is a danger that liquids, especially liquids which contain interfering substances such as alkaline materials in solution, will pass through the barrier layer as a result of capillary action within the voids in the case of air barrier layers made of porous materials. The Examiner then states that the air barrier layer is preferably hydrophobic or water repellent to the extent that capillary flow due to the above mentioned capillary action does not occur.

The Examiner asserts that Hedge teaches the formation of porous hydrophobic and hydrophilic membranes where multiple porous membranes are used together to give mechanical strength, heat stability and chemical resistance to the combined membranes. The Examiner then states that when two of the same polymer layers are used, the pore size would be the same. Thus, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to incorporate the porous membranes of Hedge into Yaginuma by incorporating another barrier layer to add an extra level of protection against allowing a liquid to migrate through the indicator layer and render the multi-layer useless.

Applicant respectfully disagrees with the Examiner. To establish obviousness of a claimed invention, all claim elements must be disclosed, taught or suggested by the prior art. Yaginuma discloses a integral multi-layer analysis element comprising a transparent support, an indicator layer, a liquid permeation barrier layer, a reagent layer and a spreading layer, adhesively laminated in this order. We agree with the Examiner that Yaginuma does not

teach that the liquid blocking layer of the present invention that is composed of at least two porous membrane layers.

Yaginuma teaches two types of barrier layers: an air barrier layer and a polymer barrier layer. The air barrier in Yaginuma consists of a porous material with connected pores in which a layer of air functions as a barrier layer. The polymer barrier layer consists of a thin homogenous, nonporous layer of hydrophobic polymer. See Yaginuma at Col. 6, lines 14-23. Since both types of barrier layers do not pass aqueous liquids, they are fundamentally hydrophobic or water repellent.

In contrast, the present invention claims a liquid blocking layer composed of at least two porous membrane layers which are impermeable to aqueous liquids and is characterized in that the diameter of the pores in the uppermost membrane, which contact the reagent layer, is equal to or smaller than that of the just underlying membrane. Yaginuma does not disclose having at least two porous membranes in the barrier layer. Further, although Yaginuma discloses that the air barrier layer has pores, the polymer barrier layer has no pores. This is unlike the present invention, where at least two of the membranes in the liquid blocking layer of the present invention have pores.

Hedge discloses improving the mechanical strength, heat stability and chemical membranes of hydrophilic membranes. Hedge teaches a method of forming hydrophilic membranes by either combining hydrophobic and hydrophilic polymers to render the membrane hydrophilic while retaining the beneficial properties conferred by the hydrophobic polymer or preparing a membrane from a hydrophobic polymer which results in a membrane having generally superior mechanical strength, heat stability and chemical membranes and then physically or chemically modifying the membrane surface to render it hydrophilic. See Hedge at Col. 1, lines 49-67.

In contrast, the present invention claims a liquid blocking layer composed of at least two porous membranes and is characterized in that the diameter of the pores in the uppermost membrane, which contact the reagent layer is equal to or smaller than that in the porous membrane just underlying the uppermost membrane. The porous membranes of the present invention are hydrophobic. Hedge does not disclose the hydrophobic porous membrane layers composing the liquid blocking layer of the present invention. Instead, Hedge discloses a method of forming hydrophilic membranes by using hydrophobic polymers. Thus, the teaching of Hedge does not even relate to the present invention.

Further, in the present invention, the function of the liquid blocking layer can be exhibited even if the porous membranes are not the same in thickness, the diameter of pores in the second porous membrane are large or by changing material of the second membrane. Also, the function of the liquid blocking layers can still be exhibited if the whole thickness of the liquid blocking layer is small. Accordingly, the pore sizes of the porous membranes that compose the liquid blocking layer do not have to be the same thickness or have the same size pores.

Thus, the Applicant believes that the amended invention is not obvious over the teaching of Yaginuma in view of Hedge since Yaginuma and/or Hedge does not teach, disclose or suggest the present claims. Moreover, one skilled in the art would find nothing in Yaginuma or Hedge alone or in combination that would disclose, teach or suggest the claimed invention or any reason for making it. Further, there is no motivation to combine the references in such a way to get the claimed invention. Therefore, an obvious rejection under 35 U.S.C. §103 (a) is improper.

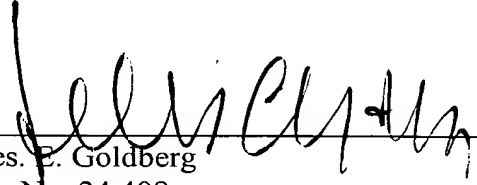
In view of the remarks presented herein, it is respectfully submitted that the present application is in condition for final allowance and notice to such effect is requested. If the

Examiner believes that additional issues need to be resolved before this application can be passed to issue, the undersigned invites the Examiner to contact him at the telephone number provided below.

Respectfully submitted,

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By


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